Colorado – Grand Canyon Watershed

Watershed Description

This watershed is defined by the Colorado River drainage area, beginning in Arizona at Lake Powell, through the Grand Canyon National Park, to Hoover Dam at Lake Mead. It does not include the Little Colorado River drainage. The watershed contains spectacular incised canyons formed by erosion of sandstone formations, as well as volcanically formed mountains and high plateaus.

Land ownership is divided approximately as: 45% federal, 25% tribal, 15% private, and 5% state. Most of the 16,437 square miles in this watershed are sparsely populated, with an approximate population of 67,500 people (2000 census). The largest communities are Kingman and Williams. Land use is primarily open grazing, recreation, and silviculture (forestry), with scattered mining districts. The Grand Canyon National Park, Kaibab National Forest, Lake Mead National Recreation Area, and Glen Canyon National Recreation Area are all located within this watershed and all have restricted land uses to protect natural resources. These federal lands also draw a large number of tourists and recreationists.

Elevations range from 1,000 feet (above sea level) along the Colorado River to 10,400 feet near Flagstaff. The majority of the watershed is between 5,000-7,000 feet elevation, with high desert fauna and flora, including coldwater aquatic communities where perennial waters exist.

Water Resources

Precipitation varies from 10-15 inches a year, including about 1 inch of snowfall per year in higher elevations. Excluding the Colorado River and its reservoirs (Lake Powell and Lake Mead), surface water is sparse.

An estimate of surface water resources in the Colorado – Grand Canyon Watershed is provided in the following table**.** Waters on Tribal lands are not assessed by ADEQ; therefore, those statistics are shown separately.

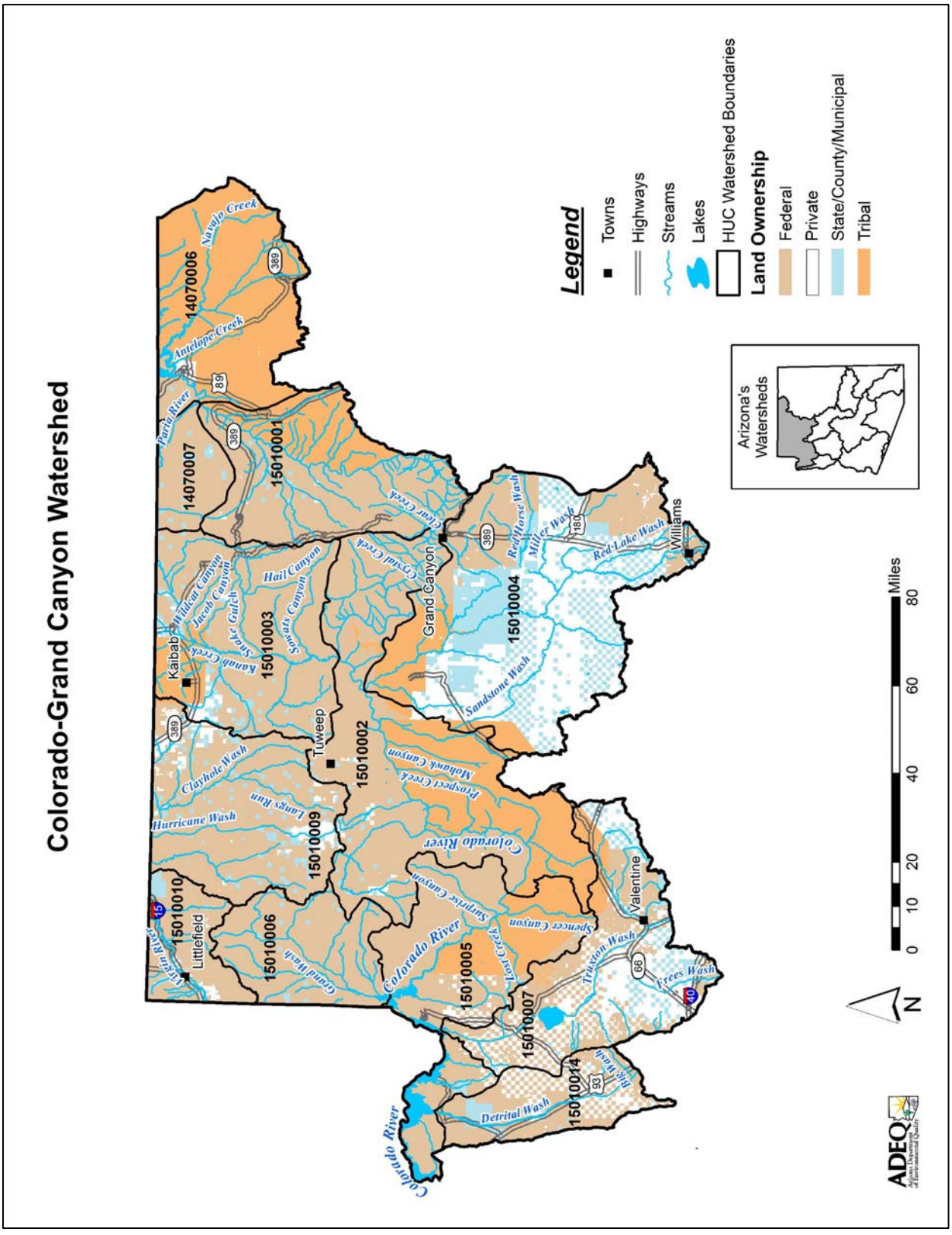
Estimated Surface Water Resources in the Colorado – Grand Canyon Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	480	260	14,870
	Perennial	Non-perennial	
Lake acres	68,400	13,415	

Additional Estimated Water Resources on Tribal Lands – Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles	125	5	3,740
	Perennial	Non-perennial	
Lake acres	390	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.



Watershed Partnerships

- Northwest Arizona Watershed Council
  Their area is defined by three groundwater basins: Hualapai Valley (in the Colorado-Grand Canyon Watershed), Sacramento Basin (in the Colorado-Lower Gila Watershed), and Big Sandy (in the Bill Williams Basin). The council's goal is to protect and preserve water resources and educate the public about water issues related to growth and development. The council meets on the 3rd Wednesday of the month in Kingman, AZ. For information, contact Elmo Roundy (928) 757-2818 or Earl Engelhardt at (928) 692-1068 or imspirit@kingmanaz.net.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL, if completed, can be obtained at ADEQ's website: www.azdeq.gov.

- The Colorado River below Lake Powell is impaired by selenium, and is impaired near Diamond Creek by suspended sediment (SSC) and selenium. The suspended sediment is at a concentration that represents a risk aquatic coldwater communities. Selenium bioaccumulates and may pose a risk to aquatic life and wildlife that prey on aquatic life (such as birds). Investigations will need to determine source loadings, especially contributions from natural background in this sandstone dominated region and contributions from upstream states (Utah and Colorado). This TMDL is scheduled to be initiated in 2010.

- The Paria River and the Virgin River are impaired due to suspended sediments (SSC).
  Elevated suspended sediment concentrations represent a risk to aquatic communities. Further investigation is needed to determine source loading, especially contributions from natural background in this sandstone dominated region, and contributions from Utah. These TMDLs are scheduled to be initiated in 2010.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- **Composting Restrooms from Hualapai Reservation Project –** Hualapai Indian Tribe (2000 and 2002)
  Composting restrooms were constructed at three beaches used by rafters and campers along the Colorado River in the Grand Canyon National Park to minimize bacterial contamination to the river.

- **The Greater Kingman Wildcat Dump Cleanup Project --** Northwest Arizona Watershed Council (2000)
  18 wildcat (illegal) dump sites in the Kingman areas were cleaned up to reduce potential surface and ground water contamination. The project also contained education and outreach to solicit community participation and minimize further dumping.

- **Bank Stabilization of Spenser Beach to Protect Composting Restrooms Project –** Hualapai Tribal Nation (2006)
  Funds were used to stabilize eroding banks surrounding the composting restroom at Spencer Beach on the Colorado River in the Grand Canyon.

- **Composting Restrooms at Helipad Project –** Hualapai Tribal Nation (2006)
  A composting restroom was constructed adjacent to a helipad landing area along the Colorado River in the Grand Canyon.

Water Protection Fund Projects – The following Water Protection Fund Projects were awarded by the Arizona Department of Water Resources. For more information about these funds or projects can be obtained at ADWR's web site at http:// www.azwater.gov.

- **Invasive Vegetation in the Grand Canyon National Park Project –** Grand Canyon National Park Foundation (2006)
  Tamarisk and other invasive vegetation were removed at seeps, springs, and tributaries in the Grand Canyon National Park to improve water supplies and riparian conditions.

- **Willow Creek Riparian Restoration Project** – Private land owner (2000)
  Riparian conditions along Willow Creek were restored to reduce sedimentation by replanting native plants, installing temporary irrigation for the new plants, and adding fencing to exclude grazing in the restored area.

Other Water Quality Studies – The following additional water quality related studies were completed since 2000 in this watershed:

- ***The Clean Colorado River Alliance Report (2006)***
  Susan Craig, ADEQ, 2006
  The Clean Colorado River Alliance Report, commissioned by Arizona Governor Janet Napolitano, identified several pollutants of particular concern for the lower Colorado River: nutrients, metals, endocrine disrupting compounds, perchlorate, bacteria and pathogens, salinity/total dissolved solids, and sediment. This report describes the impacts of these pollutants, discusses current mitigation efforts to address them, and sets forth a number of recommendations.

- ***A Monitoring Plan for the Occurrence of Hydrocarbon Constituents in Lake Powell, Mead, and Mohave, (in) Arizona, Nevada, and Utah***
  National Park Service (2004)
  Monitoring is to evaluate the effects of long-term personal watercraft on water quality in large reservoirs.

- ***Variations in Sand Storage Measured at Monumented Cross Sections in the Colorado River Between Glen Canyon Dam and Lava Falls Rapid, Northern Arizona 1992-99*** – Marilyn E. Flynn and Nancy J. Hornewer, U.S. Geological Survey (2003)
  USGS measured bed elevations in 131 cross sections to provide data on channel sand storage. Analyses of cross sections showed limited capacity to store sediment.

- ***Sediment Chemistry of the Colorado River Delta of Lake Powell, Utah, 2001*** – R.J. Hart, H.E. Taylor, R.C. Antweiler, D.D. Graham, G.G. Fisk, S.G. Riggins, and M.E. Flynn (2005)
  Sediment samples at the Colorado River delta of Lake Powell were analyzed to determine the amount of accumulation of various natural and human-introduced chemicals. Three cores and six sediment samples from sediment-water interface were collected near Hite marina where the delta is thickest. Concentrations were typical for delta sediments. Mercury concentrations ranged from 0.2 ng/g to 1,660 ng/g.

- ***Physical and Chemical Characteristics of Knowles, Forgotten, and Moqui Canyons, and Effects of Recreational Use on Water Quality, Lake Powell, Arizona and Utah –*** R.J. Hart, H.E. Taylor, R.C. Antweiler, G.G. Fisk, G.M. Anderson, D.A. Roth, M.E. Flynn, D.B. Peart, Margot Truini, and L.B. Barber (2004)
  This study documents the concentrations of trace elements, volatile organic compounds, organic wastewater contaminants (including *E. coli* bacteria), and other byproducts of fuel-based contaminants in water and bed material in Lake Lowell during the summers of 2001 and 2002.

- ***Human Health Pharmaceutical Compounds in Lake Mead, Nevada and Arizona, Las Vegas Wash, Nevada, October 2000 –August 2001 –*** Robert A. Boyd and Edward T. Furlong, U.S. Geological Survey, Open File Report 02-385 (2002)
  A reconnaissance study to investigate the occurrence of selected pharmaceutical compounds in water samples collected from Lake Mead on the Colorado River and Las Vegas Wash, a waterway used to transport treated wastewater form Las Vegas metropolitan area to Lake Mead. Thirteen of 33 targeted compounds were detected in at least one water sample. The most frequently detected compounds in the

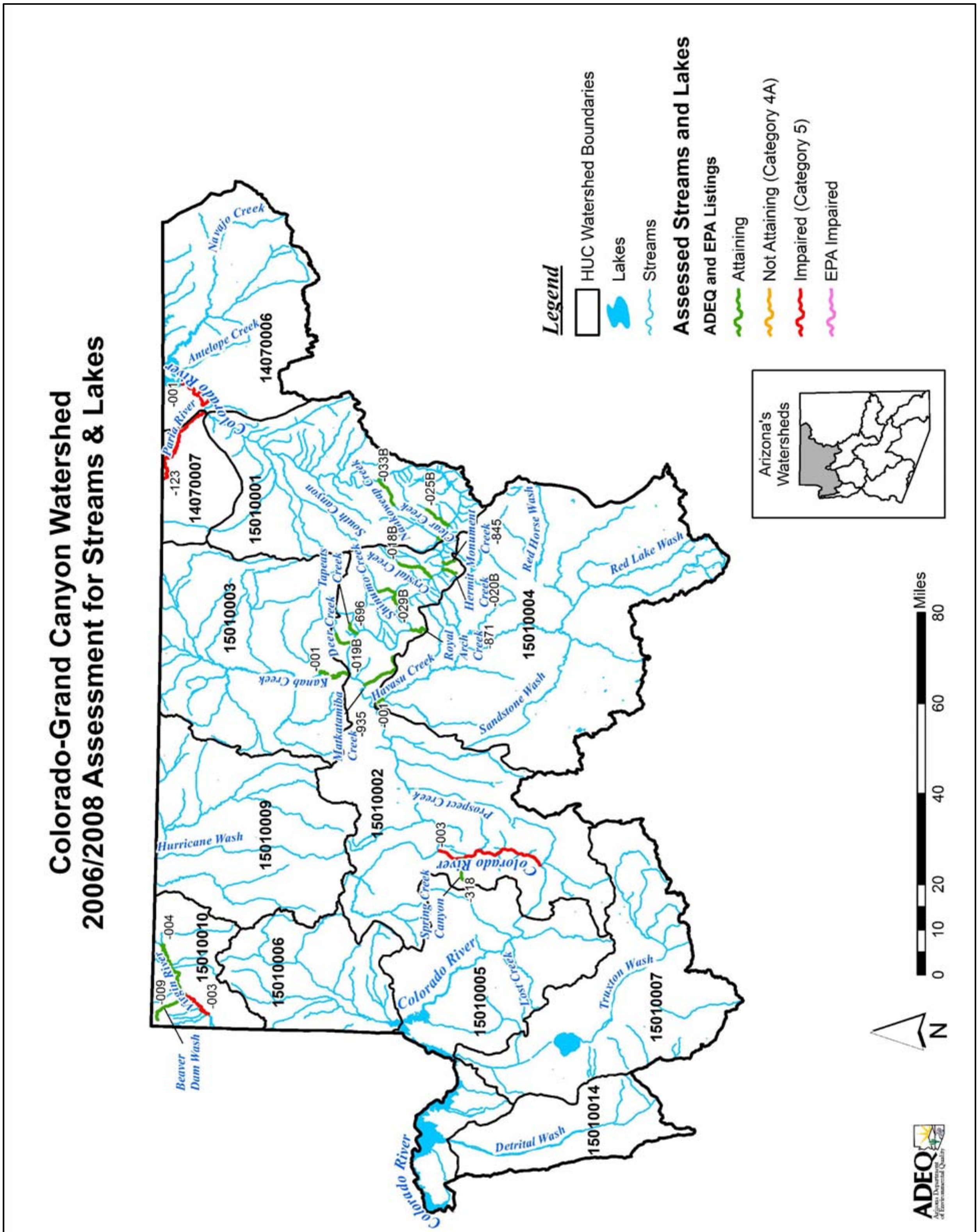
wash were caffeine, carbamazepine (used to treat epilepsy), cotinine (a metabolite of nicotine), and dehydronifedipine (a metabolite of antianginal Procardia).

Assessments

The Colorado – Grand Canyon Watershed can be separated into the following drainage areas in Arizona:

14070006	Lake Powell
14070007	Paria River
15010001	Marble Canyon
15010002	Grand Canyon
15010003	Kanab Creek
15010004	Havasu Creek
15010005	Lake Mead
15010006	Grand Wash
15010007	Red Lake
15010009	Fort Pearce Wash
15010010	Virgin River
15010014	Detrital Wash

These drainage areas and the surface waters assessed as “attaining” or “impaired” are illustrated on the following watershed map. Methods used to complete these assessments are described in the “Surface Water Assessment Methods and Technical Support” document (2006).


Colorado-Grand Canyon Watershed
2006/2008 Assessment for Streams & Lakes
Legend
HUC Watershed Boundaries
Lakes
Streams
Assessed Streams and Lakes
ADEQ and EPA Listings
Attaining
Not Attaining (Category 4A)
Impaired (Category 5)
EPA Impaired
Arizona's Watersheds
Miles
0
10
20
40
60
80
N
ADEQ
14070006
14070007
15010001
15010003
15010004
15010002
15010009
15010010
15010006
15010005
15010007
15010014
Navajo Creek
Antelope Creek
Colorado River
Paria River
South Canyon
Nankoweap Creek
Clear Creek
Shinumo Creek
Crystal Creek
Tapeats Creek
Deer Creek
Kanab Creek
Havasu Creek
Royal Arch Creek
Hermit Creek
Monument Creek
Red Horse Wash
Red Lake Wash
Sandstone Wash
Matkatamiba Creek
Prospect Creek
Hurricane Wash
Spring Creek Canyon
Virgin River
Beaver Dam Wash
Lost Creek
Truxton Wash
Detrital Wash

BEAVER DAM WASH From Utah border to Virgin River 15010010 -- 009 9.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgL -- Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/22/2004 – 04/27/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Highway 91 bridge in Littlefield, AZ CGBDW001.19 100449	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 3-4 total metals only: Boron, chromium, & manganese	4 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity
Above Virgin River CGBDW000.10 100452	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	02/02/2005 – 6143 CFU/100 ml 04/27/2005 – 270 CFU/100 ml	Inconclusive – Although 2 exceedances occurred in the last 3 years of monitoring, only 1 of them was above the screening value of 300 CFU/100 ml. One exceedance (270 CFU) occurred during flood flow. ADEQ will continue to collect samples rather than list at this time.
Lead	15 µg/L FBC	02/02/2005 – 20 µg/L	Inconclusive –1 of 4 samples exceeded criterion.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	02/02/2005 – 500 mg/L 04/27/2005 – 1920 mg/L	Inconclusive – 2 of 4 samples exceeded the 80 mg/L criterion. One value was during a high flow event (1920 mg/L), so could not be used to calculate the geometric mean. Insufficient samples left to calculate two geometric means for assessment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, *E. coli* bacteria, and SSC	All core parameters were collected		Lab detection limits for selenium and 3 dissolved mercury samples were above the A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Collect additional lead, *E. coli* bacteria, and suspended sediment samples due to exceedances. The high suspended sediment concentration indicates sediment transport. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use lower lab detection limits for selenium and dissolved mercury.	

BRIGHT ANGEL CREEK From Phantom Creek to Colorado River 15010001 -- 019 1.9 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/07/2003 – 05/04/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Phantom Ranch CGBRA001.36 100423	ADEQ Ambient	3-5 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4-5 total metals only: Boron, chromium, and manganese	5-6sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	5 *E. coli* bacteria 5 Fluoride 6 Total dissolved solids 5 Suspended sediment concentration 6 Turbidity
Below Phantom Ranch CGBRA000.44 100422	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	05/03/2005 – 168 mg/L	Inconclusive – The elevated SSC occurred during a high flow event so could not be used in the Geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional suspended sediment concentration samples due to the exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use a lower lab detection limit for selenium.	

CATARACT LAKE 15010004 – 0280 35 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 08/14/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam CGCAT - A 100015	ADEQ Ambient	1 total and dissolved metals: Chromium, nickel, silver, zinc. 1 total metal only: Antimony, arsenic, barium, beryllium, boron, cadmium, copper, lead, mercury, selenium, and thallium.	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solids 1 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Ammonia	0.40 mg/L at pH 8.8 SU and temperature 22.8 C A&Wc chronic	08/14/2003 – 0.44 mg/L at 1 meter	Inconclusive – Only 1 exceedance.
Manganese	980 µg/L DWS	08/14/2003 – 3830 µg/L	Inconclusive – Only 1 exceedance.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Ammonia and manganese	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for cadmium, copper, and lead above the A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Collect ammonia and manganese samples due to the exceedances. High ammonia levels may be a symptom of excess nutrient loadings. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect core parameters to represent at least 3 seasons during an assessment period. Use a lower lab detection limit for cadmium, copper, and lead.	

CLEAR CREEK From unnamed tributary at 360912 / 1115825 to Colorado River 15010001 – 025B 8.1 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/22/2004 – 05/03/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGCLE000.19 101964	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	

COLORADO RIVER From Lake Powell to Paria River 14070006 -- 001 16.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Attaining FC – Attaining DWS – Attaining AgI – Attaining AgL – Attaining	Category 5 Impaired	Selenium	Add selenium to the 303(d) List

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/26/2000 – 09/07/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Lees Ferry, AZ USGS #09380000 CGCLR698.93 100743	USGS Ambient	17-20 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	19-22 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	20 *E. coli* bacteria 22 Fluoride 22 Total dissolved solids 21 Suspended sediment concentration 22 Turbidity 5 Pesticides

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	11/13/2002 – 6.5 mg/L 02/04/2003 – 6.3 mg/L	Attaining – Only 2 of 21 samples showed low dissolved oxygen.
Selenium	2.0 µg/L A&Wc chronic	02/04/2003 – 3.0 µg/L 09/07/2004 – 2.4 µg/L	Impaired – 2 exceedances during the assessment period. Impairment decision supported by downstream reaches that are also listed as impaired due to selenium.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for dissolved mercury was above the A&Wc chronic criterion
MONITORING RECOMMENDATIONS		High Priority – Collect selenium samples to support development of the TMDL. Coordinate TMDL development with other selenium TMDLs in the region. Use a lower lab detection limit for dissolved mercury.	

COLORADO RIVER From Parashant Canyon to Diamond Creek 15010002 – 003 27.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive DWS – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 5 Impaired	Selenium and suspended sediment	Added sediment and selenium in 2004.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/20/2000 – 01/13/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Diamond Creek USGS #09404200 CGCLR473.00 101483	USGS and ADEQ Ambient	0-1 total and 32-28 dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, manganese, selenium, silver, uranium, and zinc 1 total metal only: Mercury	38-40 sample: total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH 0 Ammonia and nitrite/nitrate	1 Fluoride 1 Total dissolved solids 39 Suspended sediment concentration 12 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended Sediment Concentration	Geometric mean 80 mg/L A&Wc	Too many to list here. Exceedances varied from 88 to 1730 mg/L	Remains impaired – Exceeded 80 mg/L in 23 of 39 samples. Flow is regulated by upstream dam releases, but one result appeared to be during a high flow. Using the remaining data, the geometric mean (of at least 4 consecutive samples) exceeded the standard several times.
Selenium	2 µg/L A&Wc chronic	Too many to list here. All exceedances were only slightly over the standard, ranging from 2.1 to 3.8 µg/L	Remains impaired – Exceeded criterion 21 times during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient total metals (arsenic, lead, chromium, mercury, boron, manganese, and copper), fluoride, and *E. coli* bacteria to assess A&W, FBC, DWS, FC, AgI, and AgL		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		High Priority –Collect samples to support development of suspended sediment and selenium TMDLs. Collect missing core parameters to represent at least 3 seasons during the assessment period. Use a lower lab detection limit for selenium.	

CRYSTAL CREEK From unnamed tributary at 361342 / 1121148 to Colorado River 15010002 – 018B 9.1 Miles	USE SUPPORT	OVERALL ASSESSMENT		
	A&Ww – Attaining FBC – Inconclusive FC – Attaining	Category 2 Attaining some uses		

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/22/2004 – 05/03/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGCRY000.05 100525	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 µg/L FBC	07/24/2004 – 120 µg/L	Inconclusive – 1 exceedance in 4 samples. Note the relatively high magnitude of the exceedance.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Arsenic	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect arsenic samples due to the exceedance. Use a lower lab detection limit for selenium.	

DEER CREEK From unnamed tributary at 362616 / 1122815 to Colorado River 15010002 – 019B 4.9 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/08/2003 - 05/07/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGDEE000.07 100532	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Lead	15 µg/L FBC	07/26/2004 – 38.3 µg/L	Inconclusive – 1 of 4 samples exceeded.
Selenium	2.0 µg/L A&Ww chronic	07/26/2004 – 10 µg/L	Inconclusive – Only 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	07/27/2004 – 20,002 mg/L#	Inconclusive – #The exceedance occurred during a flash flood event, so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, selenium, suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect more lead, suspended sediment and selenium samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use a lower lab detection limit for selenium.	

DOGTOWN RESERVOIR 15010004 – 0580 70 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining DWS – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 06/20/2001 – 03/19/2002		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam CGDOG - A 100019	ADEQ Ambient	4 total metals only: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel selenium, silver, and zinc	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 *E. coli* bacteria 4 Total dissolved solids 4 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	09/05/2001 – 6.6 mg/L	Inconclusive – Only 1 of 4 samples did not meet standards
pH	<9.0 SU A&Wc, FBC, DWS, AgI, AgL	06/20/2001 – 9.3 SU	Inconclusive – Only 1 of 4 samples did not meet standards
Selenium	2.0 µg/L A&Wc chronic	03/19/2002 – 3.0 µg/L	Inconclusive – Only 1 exceedance during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen, pH, and selenium	Insufficient dissolved metals (cadmium, copper, zinc) and *E. coli* bacteria to assess A&Wc and FBC.		
MONITORING RECOMMENDATIONS	Medium Priority –Collect dissolved oxygen, pH, and selenium samples due to the exceedances. Collect core parameters to represent at least 3 seasons during an assessment period. The old turbidity standard (10 NTU) was exceeded in 3 of 4 visits (22, 31, and 75 NTU). Turbidity, low dissolved oxygen, and high pH may be symptoms of excess nutrient loadings. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.		

HAVASU CREEK From Havasupi Indian Reservation to Colorado River 15010004 – 001 3.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/09/2003 – 05/10/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River USGS #09404115 CGHAV000.36 100568	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 5 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	

HERMIT CREEK From Hermit Pack Trail crossing to Colorado River 15010002 – 020B 3.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/24/2004 – 05/05/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGHRM000.08 100570	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese 1 Selenium	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen 5 Dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	03/05/2005 – 5.4	Inconclusive – Only 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect more selenium samples due to exceedance. Use a lower lab detection limit for selenium.	

KAIBAB LAKE 15010004 – 0710 60 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 08/14/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam CGKAI - A 100027	ADEQ Ambient	1 total and dissolved metals: Cadmium, chromium, copper, lead, nickel, silver, zinc. 1 total metal only: Antimony, arsenic, barium, beryllium, boron, mercury, selenium, and thallium.	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solids 1 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	
MONITORING RECOMMENDATIONS		Low Priority –Collect core parameters to represent at least 3 seasons during an assessment period.	

KANAB CREEK From Jump-up Canyon to Colorado River 15010003 – 001 12.8 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining DWS – Inconclusive AgI – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/09/2003 – 05/09/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGKAN000.26 100577	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Lead	15 µg/L FBC and DWS	07/28/2004 – 28 µg/L	Inconclusive – 1 of 4 samples exceeded the criterion.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	07/24/2004 – 1484 mg/L 03/07/2005 – 153 mg/L	Inconclusive – Geometric mean of all 4 SSC samples was 128, which exceeds the 80 mg/L standard. However, a minimum of 2 exceedances of the geometric mean is required to determine impairment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead and suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect more lead and suspended sediment concentration samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use a lower lab detection limit for selenium.	

LAKE POWELL 14070006 – 1130 9770 Acres (In Arizona)	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/32/2004 – 04/14/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Antelope Marina – 102956 Blue Notch – 103011 Bullfrog Marina – 102983 Dangling Rope Marina – 102978 Escalante Creek – 102980 Farley Canyon – 103012 Forgotten 5 – 102984 Halls Crossing Marina – 102981 Knowles 3 – 102985 Lone Rock Beach – 102974 Moqui 4 – 102982 Padre Bay – 102975 Rainbow Bridge – 102977 San Juan River – 102979 State Line – 102973 Wahweep Marina – 102972 Warm Creek Bay - 102976	USGS Special study	None	None	17 Petroleum products 17 Chlorinated hydrocarbons and other VOCs

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing core parameters		
MONITORING RECOMMENDATIONS		Low Priority –Collect sufficient core parameters to represent at least 3 seasons during an assessment period.	

MATKATAMIBA CREEK From headwaters to Colorado River 15010002 – 935 12.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining All Uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/28/2004 – 05/09/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGMAT000.03 100591	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese, and selenium	4sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	01/10/2005 – 5.6 µg/L 03/07/2005 – 6.7 µg/L 05/09/2005 – 6.1 µg/L	Attaining – Selenium contamination is entirely due to natural sources in this remote and small drainage in the Grand Canyon National Park.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium.	

MONUMENT CREEK From headwaters to Colorado River 15010002 – 845 3.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining Some Uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/07/2003 – 05/05/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGMON000.19 101434	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese 2 total metals only: Selenium	4-5sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L A&Ww chronic	03/04/2005 – 0.13 µg/L	Inconclusive – Only 1 exceedance during the assessment period.
Selenium	2.0 µg/L A&Ww chronic	03/04/2005 – 5.5 µg/L 05/05/2005 – 6.7 µg/L	Attaining – Selenium contamination is entirely due to natural sources in this remote and very small drainage in the Grand Canyon National Park.
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	01/07/2005 – 135 mg/L	Attaining – The criterion (80 mg/L) was exceeded, but the geometric mean of all 4 samples did not exceed the standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect additional mercury samples due to the exceedance. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

NANKOWEAP CREEK From unnamed tributary at 361530 / 1115723 to Colorado River 15010001 – 033B 7.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/05/2003 – 05/02/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGNAN000.20 100594	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	01/05/2005 – 932 mg/L	Inconclusive – The elevated SSC occurred soon after a high flow event so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional suspended sediment concentration samples due to the exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use a lower lab detection limit for selenium.	

PARIA RIVER From Utah Border to Colorado River 14070007 -- 123 29.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Impaired FC – Attaining	Category 5 Impaired	Suspended sediment and *E. coli* bacteria	Add *E. coli* bacteria. Added suspended sediment in 2004.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/14/2000 – 04/26/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At mile 7.5 CGPAR021.57 101076	ADEQ TMDL	4-9 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thallium, and zinc 4-9 total metals only: Boron, manganese, mercury 1 total metals only: Selenium	4-6 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 9 Fluoride 4 Total dissolved solids 30 Suspended sediment concentration 9 Turbidity
Mile 15 CGPAR014.25 101075	ADEQ TMDL			
Mile 22.5 CGPAR008.41 101074	ADEQ TMDL			
Above Colorado River CGPAR001.62 100617	ADEQ Ambient			
At Lees Ferry USGS #09382000 CGPAR001.23 101447	USGS Special Study (SSC)			
At Lees Ferry CGPA000.49 101073	ADEQ TMDL			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	07/20/2004 – 2250 CFU/100 ml 01/31/2005 – 317 CFU/100 ml 04/26/2005 – 250 CFU/100 ml	Impaired – 3 exceedances during the assessment period. Two were above the screening value of 300 CFU/100 ml.
Lead	15 µg/L FBC	07/20/2004 – 75 µg/L 11/08/2004 – 49 µg/L 01/31/2005 – 66 µg/L	Inconclusive –3 exceedances in 6 samples. (Requires a minimum of 5 exceedances in 20 samples to determine impairment.)
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	Too many exceedances to list here. Results varied from 53 to 70,400 mg/L.11 results were above 10,000 mg/L.	Remains impaired – 20 of 30 samples exceeded the 80 mg/L criterion. Only one result was during high flows. Geometric mean was exceeded repeatedly.
Selenium	2.0 µg/L A&Ww chronic	04/26/2005 – 14 µg/L	Inconclusive – 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	**MISSING CORE PARAMETERS**	**MISSING SEASONAL DISTRIBUTION**	**DETECTION LIMITS NOT LOW ENOUGH**
Lead and selenium	**All core parameters were collected**		Lab detection limit for selenium was above the A&Wc chronic criterion
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria and suspended sediment concentration samples to support TMDL development. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Collect additional selenium and lead samples due to the exceedances. Use a lower lab detection limit for selenium.	

ROYAL ARCH CREEK From headwaters to Colorado River 15010002 – 871 5.1 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/08/2003 – 05/06/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGRYA000.05 100632	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	07/25/2004 – 5.1 µg/L 05/06/2005 – 6.0 µg/L	Attaining – Selenium contamination is entirely due to natural sources in this remote and small drainage in the Grand Canyon National Park.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium.	

SANTA FE RESERVOIR 15010004 – 1340 12 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 08/14/2003 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam CGSAT - A 100083	ADEQ Ambient	1 total and dissolved metals: Chromium, copper, nickel, zinc. 1 total metal only: Antimony, arsenic, barium, beryllium, boron, cadmium, lead, mercury, selenium, silver	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solids 1 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	6.9 µg/L at 49 mg/L hardness A&Wc chronic	08/14/2003 – 10 µg/L	Inconclusive – Only 1 exceedance during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for dissolved metals (cadmium, lead, and silver) and thallium were above the A&Ww chronic criteria.

MONITORING RECOMMENDATIONS	
	Medium Priority –Collect copper samples due to the exceedance. Collect core parameters to represent at least 3 seasons during an assessment period. Use a lower lab detection limit for dissolved metals and thallium. The old turbidity standard (10 NTU) was exceeded and pH was at the standard (9.05 SU), although it did not technically exceed the standard. Turbidity and high pH may be symptoms of nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.

SHINUMO CREEK From unnamed tributary at 361821 / 1121803 to Colorado River 15010002 – 029B 8.8 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/25/2004 – 05/06/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGSHI000.05 100532	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	05/06/2005 – 500 mg/L	Inconclusive – The exceedance occurred during a high flow event, so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means for the assessment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect more suspended sediment samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use a lower lab detection limit for selenium.	

SPRING CANYON CREEK From headwaters to Colorado River 15010002 – 318 6.0 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/10/2003 – 05/11/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGSPG000.17 100648	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 5 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	

TAPEATS CREEK From headwaters to Colorado River 15010002 – 696 12.8 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/26/2004 – 05/07/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGTAP000.08 100662	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	05/07/2005 – 110 mg/L	Inconclusive – The exceedance occurred during a flash flood event, so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment concentration	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect addition SSC data due to exceedance. Use a lower lab detection limit for selenium.	

VIRGIN RIVER From Black Rock Gulch to Sullivan's Canyon 15010010 -- 006 10.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgI – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/21/2004 – 04/27/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At I-15 rest stop CGVGR052.23 100679	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, nickel, selenium, silver, thallium, and zinc 3-4 total and 0-1 dissolved: Boron, chromium, manganese, mercury 1 total metals only: Selenium	4 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	09/21/2004 – 720 CFU/100 ml 11/09/2004 – 383 CFU/100 ml	Inconclusive – 2 exceedances during the last 3 years of monitoring; however, one occurred during high flows when bacteria are naturally elevated. More monitoring is needed to determine whether impairment is occurring.
Lead	15 µg/L FBC	11/09/2004 – 89 µg/L	Inconclusive –1 of 4 samples exceeded criterion.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	09/21/2004 – 930 mg/L 11/09/2004 – 5383 mg/L 02/01/2005 – 330 mg/L 04/27/2005 – 2700 mg/L	Inconclusive – All 4 samples exceeded the 80 mg/L criterion. One value was during a high flow event (2700 mg/L), so could not be used to calculate the geometric mean. Insufficient samples left to calculate two geometric means and determine impairment.
Selenium	2.0 µg/L A&Ww chronic	11/09/2004 – 19.0 µg/L	Inconclusive– 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
E. coli bacteria, lead, suspended sediment, and selenium	All core parameters were collected		Lab detection limits for selenium and dissolved mercury were above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority – Collect E. coli bacteria, lead, SSC, and selenium samples due to exceedances. Use lower lab detection limits for selenium and dissolved mercury.	

VIRGIN RIVER From Sullivan's Canyon to Beaver Dam Wash 15010010 -- 004 9.7 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgI – Attaining AgL -- Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/22/2004 – 04/27/2005 NUMBER AND TYPES OF SAMPLES Metals	Nutrients – Related	Other
At Littlefield, AZ CGVGR039.41 100680	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc 3-4 total and 0-1 dissolved: Boron, manganese, mercury 1 total metals only: Selenium	4 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 *E. coli* bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	11/10/2004 – 367 CFU/100 ml 04/27/2005 – 300 CFU/100 ml	Inconclusive – Although 2 exceedances in the last 3 years of monitoring, only 1 of them was above the screening value of 300 CFU/100 ml (other is at the screening value). ADEQ will continue to collect samples rather than list at this time.
Lead	15 µg/L FBC	11/10/2004 – 35 µg/L	Inconclusive –1 of 4 samples exceeded criterion.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	09/22/2004 – 302 mg/L 11/10/2004 – 2900 mg/L 02/01/2005 – 313 mg/L 04/27/2005 – 4500 mg/L#	Inconclusive– All 4 samples exceeded the 80 mg/L criterion. #One value was during a high flow event (4500 mg/L), so would not be used to calculate the geometric mean. Insufficient samples left to calculate two geometric means and determine impairment.
Selenium	2.0 µg/L A&Ww chronic	11/10/2004 – 7.2 µg/L	Inconclusive– 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, *E. coli* bacteria, suspended sediment, and selenium	All core parameters were collected		Lab detection limits for selenium and dissolved mercury were above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority –Collect additional lead, *E. coli* bacteria, SSC, and selenium samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use lower lab detection limits for selenium and dissolved mercury.	

VIRGIN RIVER From Beaver Dam Wash to Big Bend Wash 15010010 -- 003 10.1 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Inconclusive FC – Attaining AgI – Inconclusive AgL -- Inconclusive	Category 5 Impaired	Suspended sediment and selenium	Added suspended sediment and selenium in 2004.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/06/2000 – 08/09/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Littlefield, AZ USGS #09415000 CGVGR010.18 (not in ADEQ's database)	USGS Ambient	22 dissolved metals only: Arsenic, boron, selenium	23-25 samples: Ammonia, total phosphorus, nitrate/nitrite, dissolved oxygen, pH	16 *E. coli* bacteria 22 Fluoride 22 Suspended sediment concentration 18 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Boron	1000 µg/L AgI	08/22/2000 – 1020 µg/L	Inconclusive – Only 1 exceedance. Samples were only the dissolved portion. Need total boron samples.
E. coli bacteria	235 CFU/100 ml FBC	03/26/2003 – 520 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	Too many to list here. Exceedances ranged from 83 to 5030 mg/L.	Remains impaired – 17 of 22 samples exceeded the standard. Geometric mean of 4 consecutive samples exceeded the 80 mg/L standard repeatedly.
Selenium	2.0 µg/L A&Ww chronic	08/29/2001 – 2.2 µg/L 05/20/2002 – 2.8 µg/L 08/27/2002 – 2.8 µg/L 02/26/2003 – 2.7 µg/L 05/27/2003 – 2.6 µg/L 03/02/2004 – 2.4 µg/L 06/15/2004 – 2.4 µg/L 08/09/2004 – 2.9 µg/L	Remains impaired – 8 exceedances during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Boron and *E. coli* bacteria	Insufficient dissolved metals (cadmium, copper, zinc), mercury, boron, manganese, copper, and lead		
MONITORING RECOMMENDATIONS		High Priority – Collect samples to support development of selenium and suspended sediment concentration TMDLs. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Collect additional boron and *E. coli* bacteria samples due to exceedances. Collect core parameters to represent at least 3 seasons during the assessment period.	

[This page intentionally left blank.]